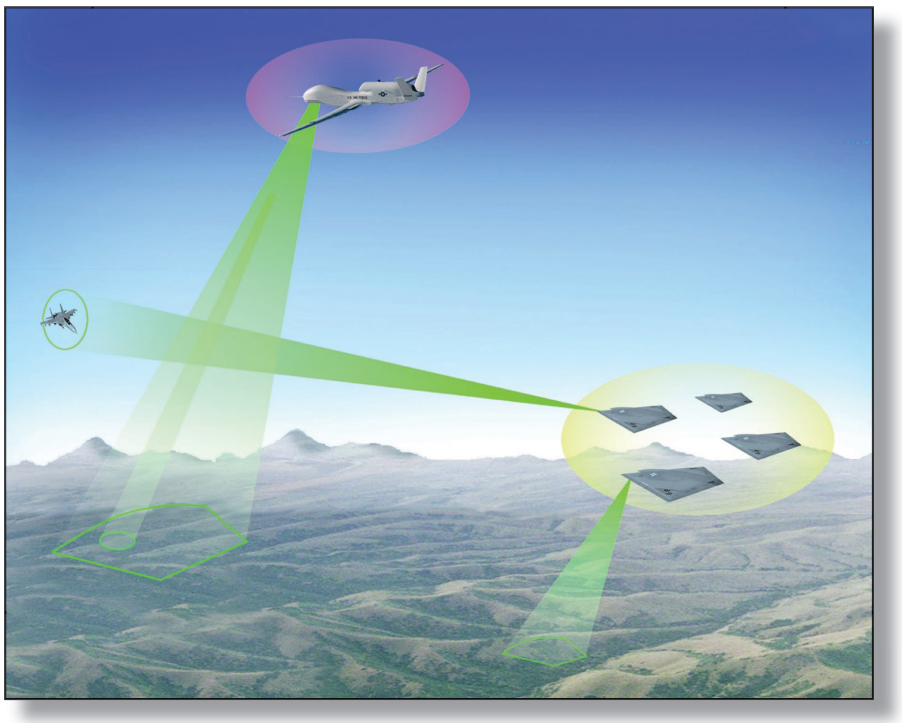
Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

AFRL DEVELOPS AIRSPACE OPERATIONS' SENSING REQUIREMENTS FOR UAV AND TRANSFERS TECHNOLOGY TO CIVILIAN USERS



The Air Vehicles Directorate has transferred unmanned air vehicle (UAV) sensing system requirements for airspace operations to civilian users and UAV developers, providing design goals on which to base future sensing subsystem designs and filling a glaring omission in UAV technology planning. The directorate is developing technologies that enable future UAVs to coexist as safely as manned aircraft in both military and civilian airspace.

Using these requirements ensures that UAVs will detect possible conflicts, such as mid-air collisions and runway excursions, so users can take the appropriate action to avoid the conflict. The technology transferred forms a worldwide baseline for the UAV community.

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Accomplishment

Working with engineers from Northrop Grumman Corporation, AFRL engineers established, iterated, and finalized sensing system performance requirements for the broad range of future US Air Force missions. Throughout the process, directorate engineers noted that many mission elements are similar to civilian airspace operations tasks, and that the requirements were directly applicable to civilian UAV technology.

The engineers also noted that no compendium or report existed which defined and expressed these requirements. To transfer this technology, the directorate coordinated report writing with the American Institute for Aeronautics and Astronautics focal point for UAV airspace integration, transitioning the groundbreaking report in time for presentation at the UAV airspace integration meeting. The far-reaching insight of the directorate's research is directly impacting the airspace operations' sensing systems for current and future UAVs.

Background

In order to share airspace with manned aircraft, UAVs must detect conflict situations effectively as manned aircraft. Because this is not currently the case, the Air Force segregates UAVs from manned airspace--placing a significant restriction on UAV operational usefulness.

To eliminate this segregation, UAVs need to sense the presence of other aircraft in their operating environment. For this reason, directorate researchers identified a need to replicate the human see-and-avoid capability on board UAVs for acceptance into the National Air Space. Not all aircraft have air traffic transponders, so UAVs cannot rely on those alone. UAVs must use on-board sensors to detect aircraft and fuse that with available transponder information to give UAVs and UAV operators situational awareness of the airspace around the vehicle to ensure that unmanned aircraft are as safe as our manned aircraft.

Air Vehicles
Technology Transfer

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-VA-01)